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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,176	12/05/2001	Sam Yang	M4065.0210-/P210-A	3795
24998	7590	12/23/2003	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			TRINH, HOA B	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	

2814

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/002,176	YANG ET AL.	
	Examiner	Art Unit	
	Vikki H Trinh	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-96 is/are pending in the application.
- 4a) Of the above claim(s) 69-96 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 32-61, 64-68 are rejected under 35 U.S.C. 102(e) as being anticipated by Narwankar et al. (6,475,854).

Narwankar et al. (6,475,854) discloses a method of forming a capacitor in a semiconductor device, the method including the steps of:

With respect to claims 32, 56-61, 64-68, forming a bottom conducting layer 909, 602, 604, 605 forming a dielectric layer 912, 606 over the bottom conducting layer, forming a top conducting layer 608, 610 and annealing the entire top conducting layer with an oxidizing gas anneal/ultraviolet/plasma enhanced at 200-800 degrees Celsius, 2 torr at 15 seconds to 10 minutes, 01-10 liters per second of oxygen gas. See col. 12, table 1, col. 10, lines 15-40, col. 11, lines 4-50.

As to claim 33, the capacitor is formed over a conductive plug 908, the steps further includes depositing an oxygen barrier /insulator 912 over the plug prior to forming the bottom conducting layer 909. See figures 3-6 and column 6, lines 44-45.

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As to claim 34, the steps include annealing the dielectric layer 912. See col. 15, lines 25-30.

As to claims 35-41, 48-55, the bottom and top conducting layers are made from Pt or Rh. See col. 12, table I.

As to claims 42-46, the dielectric layer is made of Ta₂O₅ or BST, which has a high dielectric constant of over 10 which is within the claimed range. See col. 12, table I.

As to claim 47, the amorphous dielectric layer is heated to a temperature of over 200 degrees Celsius to change the layer to crystalline. See col. 12, Table I.

As to claim 49-55, the top and the bottom conducting layer is a noble metal (Pt, Ru, RuO). See col. 12, Table I, col 15, lines 45-50.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 62-63 rejected under 35 U.S.C. 103(a) as being unpatentable over Narwankar et al. (6,475,854).

Narwankar et al. (6,475,854) discloses the invention substantially as claimed. However, Narwankar et al. (6,475,854) does not explicitly state the ranges of 400-750 degrees Celsius and 300-800 degrees Celsius for the temperature of the heating treatment. Nonetheless, it would have been obvious to one skilled in the art at the time the invention was made to modify the temperature range (200-800 degrees Celsius) of Redwing with 400-750 degrees Celsius and

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300-800 degrees Celsius, respectively, since it is prima facie obvious to an artisan experimentation and optimization because applicant has not yet established any criticality for those specific ranges.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. (In re Woodruff, 919 F.2d 1575, 1578 (Fed. Cir. 1990).)

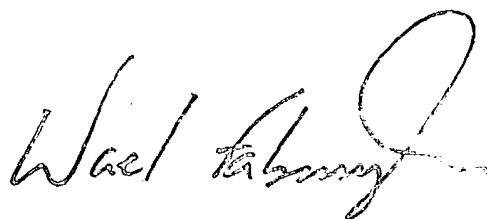
Response to Arguments

Applicant's arguments filed 12/05/03 have been fully considered but they are not persuasive. In *Narwankar*, the examiner interprets the term "entire" to mean "complete". By doing so, the complete layer 608,610 is a top layer relative to the dielectric layer 606. The second upper layer 612 is an entire different upper layer from the top layer 608, 610. Therefore, the rejection is proper.

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (703) 308-8238. The Examiner can normally be reached Mon-Tuesday, Thurs-Friday, 7:30 AM - 6:00 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (703) 308-4918. General inquiries relating to the status of this application should be directed to the Group receptionist at (703) 308-0858. The fax number is (703) 308-2708.

Vikki Trinh,
Patent Examiner
AU 2814



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